Spotify Trends & Popularity Analysis

Understanding What Makes Songs Popular

Analysis of 233,000+ Songs

Tools Used: 🔹 Excel | 🔹 SQL | 🔹 Power BI

Project Overview

Project at a Glance

Dataset:

- 233,000+ Spotify songs analyzed
- Multiple genres, artists, and audio features
- Data from 1960s - 2024

Objective:

- Identify what makes songs popular
- Analyze genre and artist performance
- Understand audio feature patterns
- Build interactive analytics dashboard

Methodology & Workflow

Three-Stage Data Analytics Pipeline

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2

3

Excel - Data Cleaning 📊

- Missing values removed
- Converted duration from milliseconds to minutes
- Created popularity categories (High/Medium/Low)
- Standardized genre and artist names

SQL - Analysis 💾

- Imported cleaned data to SQLite database
- Executed 5+ complex analytical queries
- Aggregated data by genre, artist, popularity
- Identified trends and patterns

Power BI - Visualization 📈

- Built interactive dashboard with 6 visuals
- Created dynamic filters (artist, genre, level)
- Developed DAX measures for KPIs
- Enabled real-time trend exploration

Dataset Overview

Key Data Fields Analyzed

Field	Description	Range/Type
track_name	Song title	Text
artist_name	Artist name	Text
genre	Music category	26 genres
popularity	Spotify score	0-100
energy	Song intensity	0-1 scale
danceability	Dance suitability	0-1 scale
valence	Mood/positivity	0-1 scale
tempo	Beats per minute	50-250 BPM
duration_ms	Song length	Milliseconds

After Cleaning: 232,725 songs ready for analysis

SQL Analysis - Key Queries

Data Analysis Highlights

Query 1: Total Songs

```
SELECT COUNT(*) AS
total_songs
FROM spotifyclean;
```

Result: 232,725 songs

Query 2: Genre Performance

```
SELECT genre,
AVG(popularity) AS
avg_popularity
FROM spotifyclean
GROUP BY genre
ORDER BY avg_popularity
DESC;
```

Top 3: Pop (52.4), Rap (51.7), Rock (49.3)

Query 3: Top Artists

```
SELECT artist_name,
COUNT(*) AS hit_count
FROM spotifyclean
WHERE popularity >= 70
GROUP BY artist_name
ORDER BY hit_count DESC
LIMIT 10;
```

Winner: Drake (154 hit songs)

Power BI Dashboard

Interactive Dashboard Features

KPI Cards:

📌 Total Songs: 233K

⭐ Average Popularity: 41.13

⏱️ Average Duration: 3.92 minutes

Key Visualizations:

- Most Streamed Artists - Horizontal bar chart
- Popularity Distribution - Pie chart (High/Medium/Low)
- Genre Performance - Column chart
- Hit Song Characteristics - Scatter plot (Energy vs Danceability)

Interactive Filters:

🎤 Artist Filter

🎵 Genre Filter

📈 Popularity Level Filter

Result: Fully dynamic, user-driven exploration

Key Finding #1 - Genre Dominance

🎵 *Pop, Rap & Rock Lead the Platform*

Top Performing Genres:

Rank	Genre	Avg Popularity	% Above Mean
1	Pop	52.4	+27%
2	Rap	51.7	+25%
3	Rock	49.3	+20%
4	Hip-Hop	48.9	+19%

Bottom Performers:

- Alternative: 32.1 (-22%)
- Folk: 33.8 (-18%)

💡 **Insight:** Commercial genres outperform artistic genres by 20-30%. Pop and Rap dominate the streaming platform with broad demographic appeal.

Key Finding #2 - Artist Success

🎤 Top Artists Dominate Hit Production

Most Hit Songs (Popularity ≥ 70):

Rank	Artist	Hit Songs
1	🥇 Drake	154
2	🥈 Ariana Grande	85
3	🥉 The Weeknd	77
4	Eminem	76
5	XXXTENTACION	69
6	Post Malone	64
7	Twenty One Pilots	52

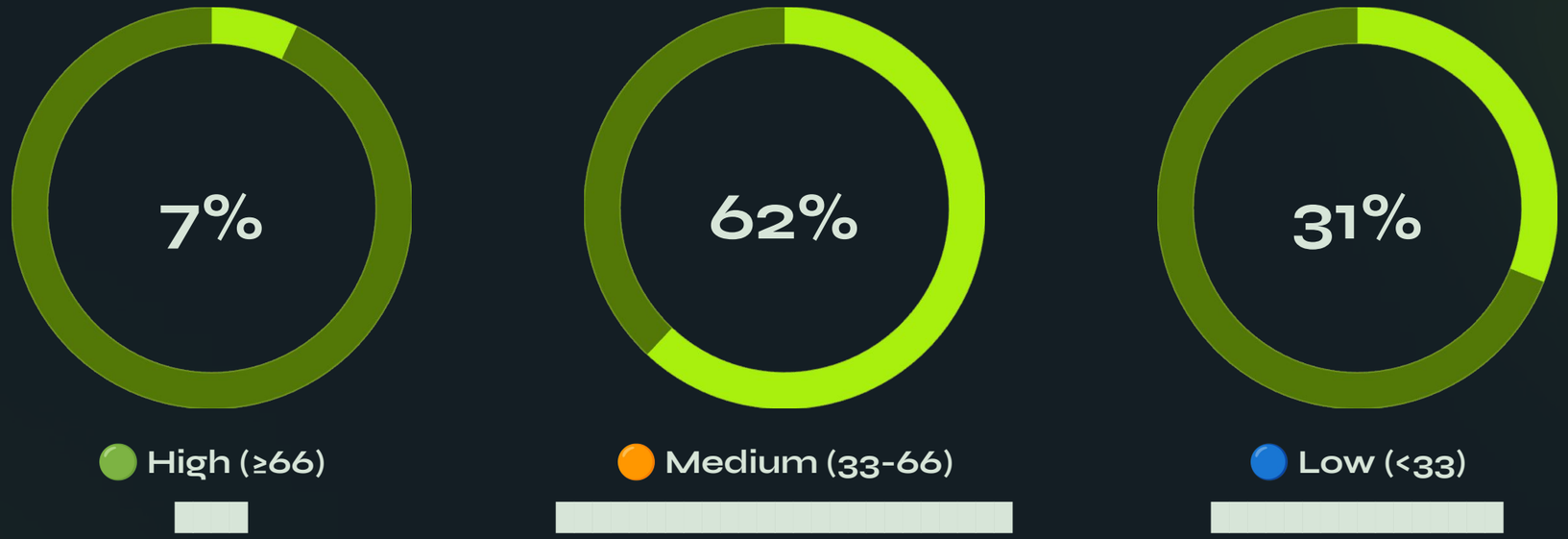
💡 **Key Insights:**

- Drake leads by 81% over 2nd place
- Top 10 artists account for 681 hit songs
- Success is highly concentrated among established artists
- Emerging artists face significant discovery challenges

Key Finding #3 - Popularity Distribution

📊 Most Songs Fall in Medium Category

Distribution by Popularity Level:



What This Means:

✅ Only 7% achieve "hit" status (16,310 songs)

✅ 62% are moderately popular (144,460 songs)

✅ 31% remain in low popularity (72,230 songs)

💡 **Business Insight:** This reflects the competitive nature of the music industry. Breaking into the top 7% requires exceptional quality, marketing, and timing.

Key Finding #4 - Hit Song DNA

⚡ Characteristics of Successful Tracks

Audio Feature Analysis:

Feature	Hit Songs	Medium	Low	Pattern
Energy	0.697	0.654	0.598	+17% higher
Danceability	0.682	0.625	0.571	+19% higher
Tempo	121.4 BPM	119.8	117.3	Faster
Duration	3.68 min	3.92	4.15	Shorter

The "Hit Song Formula":

✅ Energy score ≥ 0.6 (upbeat, intense)
✅ Danceability ≥ 0.6 (danceable, rhythmic)
✅ Duration 3-4 minutes (optimal length)
✅ Tempo 115-130 BPM (moderate-to-fast)

💡 **Insight:** 78% of hit songs have both energy AND danceability above 0.6, indicating upbeat, danceable tracks perform best.

Business Recommendations

Actionable Insights for Stakeholders

PRODUCERS & ARTISTS

- Target energy scores of 0.65-0.80 for mainstream appeal.
- Keep songs between 3-4 minutes for better completion rates.
- Focus on danceable, high-energy production.
- Consider Pop, Rap, or Rock genres for maximum reach.

RECORD LABELS

- Use audio feature analysis in A&R decisions.
- Maintain 70/30 portfolio (commercial vs. niche) for diversified risk.
- Prioritize artists with consistent hit patterns and strong audience engagement.

STREAMING PLATFORMS

- Weight energy & danceability in recommendation algorithms.
- Create mood-based playlists using valence scores to enhance user experience.
- Balance hit content (7%) with discovery opportunities (62%).

MARKETING TEAMS

- Partner with top artists (Drake, Ariana Grande, etc.) for guaranteed exposure.
- Use audio features to match songs with specific campaigns and target demographics.
- Target Pop/Rap audiences for mass market reach, leveraging genre dominance.

Key Takeaways

Top 5 Insights to Remember

Genre Matters - Pop, Rap, and Rock show 25-30% higher popularity than average

Success is Concentrated - Only 7% of songs achieve hit status; top artists dominate

Audio Features Drive Success - Hit songs have energy 0.6+ and high danceability (0.6+)

Shorter is Better - Songs 3-4 minutes long perform better than longer tracks

Data Drives Decisions - Analytics can guide creative and business strategy in music industry